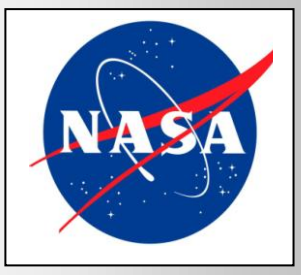
The

October-November 2014

Giovanni News



NASA Goddard Earth Sciences Data and Information Services Center (GES DISC)

From the Editor:

Hello again – here is *The Giovanni News* for October and November 2014. The primary story in this issue is a recap of the 2nd Gregory G. Leptoukh Online Giovanni Workshop. The workshop was very successful; the presentations were all very high quality, technical difficulties were at a minimum (high praise goes to meeting host Jennifer Brennan, who ironed out many potential problems in dry runs with the authors before the workshop), and information exchange was excellent between authors and audience.

The issue includes where to go to watch and listen to recordings of the live presentation, a reminder of where the posters are located (you can still look at them), and a couple of images from my own presentation on the Lake Erie toxic phytoplankton bloom in August. Lake Erie certainly seems to be in the news these days; I wonder what insights Giovanni might be able to provide about the extraordinary lake effect snow that hit the region a few days ago?

We also have a couple of research paper highlights from the past month, and another inspirational Giovanni slogan. Would anyone like me to compile all of these (they've been fun to make)?

Regards,

Your editor, Jim Acker

Research Paper Highlights from October 2014

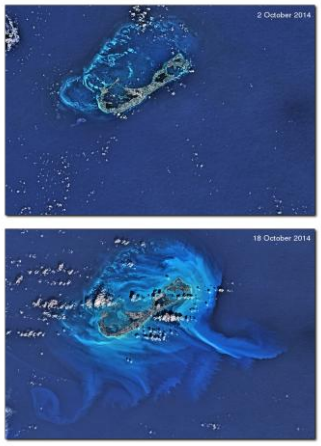
Creamean, J. M., Spackman, J.R., Davis, S.M., and White, A.B. (2014) Climatology of long-range transported Asian dust along the West Coast of the United States. *Journal of Geophysical Research - Atmospheres*, **119**, doi:10.1002/2014JD021694.

Román, R., Bilbao, J., and de Miguel, A. (2014) Reconstruction of six decades of daily total solar shortwave irradiation in the Iberian Peninsula using sunshine duration records. *Atmospheric Environment*, **99**, 41-50, doi:10.1016/j.atmosenv.2014.09.052.

Zhang, H., Han, Z., Zhao, J., Yu, P., Hu, C., Sun, W., Yang, D., Zhu, G., Lu, B., Peter, H-U., and Vetter, W. (2014) Phytoplankton and chlorophyll a relationships with ENSO in Prydz Bay, East Antarctica. *Science China Earth Sciences*, doi:10.1007/s11430-014-4939-8.

Zhang, X., Mao, M., Berg, M.J., and Sun, W. (2014) Insight into wintertime aerosol characteristics over Beijing. *Journal of Atmospheric and Solar-Terrestrial Physics*, **121, Part A**, 63-71, doi:10.1016/j.jastp.2014.09.017.

In this issue:



Sediment flows off Bermuda after the passage of Hurricane Gonzalo (from NASA Earth Observatory).

Recap of the 2nd Gregory G. Leptoukh Online Giovanni Workshop – Day 1

The first day of the workshop opened with a greeting and acknowledgment of support (particularly to workshop host Jennifer Brennan) by organizer James Acker. He followed the introduction with a presentation on the current state of data products and visualization capabilities on Giovanni. The leader of the Giovanni-4 development project, Christopher Lynnes, then provided a comprehensive overview of Giovanni-4, highlighted with several of the system's newest visualization capabilities. The morning finished with a short discussion of recent research and Giovanni's social media connections. In the afternoon, Cecile Rousseaux of Goddard Space Flight Center (GSFC) described advances in the NASA Ocean Biogeochemical Model analysis, which now incorporates MODIS data. This effort has not identified significant trends in global ocean chlorophyll over the 15 years covered by the data. Gregory Jenkins of Howard University discussed the impact of Saharan dust in West Africa, including its relationship to public health concerns, including meningitis and asthma. The first day concluded with Ramesh Singh's (Chapman University) presentation on natural hazards and remote sensing, in which he showed several remarkable precursors to significant earthquakes.

Recap of the 2nd Gregory G. Leptoukh Online Giovanni Workshop – Day 2

Pavel Kishcha of Tel Aviv University led off the second day with a presentation on the hemispheric asymmetry of aerosols and clouds over the tropical Atlantic. The asymmetry was seasonal, most pronounced March through July due to dust from the Sahara Desert. Adnan Al-Azri of Sultan Qaboos University, Oman, discussed the changing phytoplankton species in the Arabian Sea, particularly observations of large *Cochlodinium polykrikoides* blooms in 2008 and 2009. John Lehrter of the Environmental Protection Agency office in Gulf Breeze, Florida, demonstrated how multiple data products contribute to models allowing examination of the development and persistence of coastal hypoxia on the Louisiana continental shelf in the Gulf of Mexico. Bumjun Kil of the University of Southern Mississippi described the cause and context of a unique event in the Gulf of Mexico, an optically detectable "tail" observed after the passage of Hurricane Isaac. Yoana G. Voynova-Buckley concluded the day on the subject of upwelling and the Delaware Bay, a process which delivers nutrients to the lower bay and coastal ocean. According to Voynova-Buckley, phytoplankton benefiting from these nutrients are immediately consumed by hungry zooplankton.

Recap of the 2nd Gregory G. Leptoukh Online Giovanni Workshop, Day 3

The subject of neural networks might seem mentally difficult to grasp, but Michael Taylor of the National University of Athens succeeded in describing how they are used to characterize aerosol size distributions globally, utilizing several NASA data sources. Shovonlal Roy of the University of Reading (UK) revealed how time-series acquired from Giovanni can be used to analyze the bio-dynamics of phytoplankton, including their growth rate and size spectra. YangYang Xu, from the National Center for Atmospheric Research in Boulder, CO, showed how his analyses can distinguish between several different aerosol types over California, which can be used to derive their contribution to radiative forcing and atmospheric heating. The day finished with James Acker, who used data sets in Giovanni to examine the precursors to a toxic algae bloom in Lake Erie that endangered the water supply for Toledo, Ohio. Acker's analysis indicated that warm sunny summer afternoons may have accelerated the growth of the toxic phytoplankton species *Microcystis*.

Recap of the 2nd Gregory G. Leptoukh Online Giovanni Workshop – Global Poster Session

The Global Poster Session is located at this URL:

http://disc.sci.gsfc.nasa.gov/giovanni/additional/newsletters/2nd_giovanni_online_workshop_global_poster_session

The Global Poster Session was an international event featuring contributions from Ecuador, Russia, India, Nigeria, and the UK, as well as several from institutions in the United States. *Sheila Serrano* and colleagues from the National Polytechnic School, Quito, Ecuador, examined the self-organized criticality of rainfall events in their country, finding a power-law behavior in the relationship of the number of rainfall events to mm of rainfall for 10-minute resolution precipitation data. *Prashant Kumar* described how assimilation of satellite rainfall data improved weather models for India. Using a variety of satellite data sets, *Anubha Agrawal* quantified several different influences on the Himalayas, finding that air pollution is a clear contributor to regional changes, including loss of glacierised area. Potentially related to this research was the work described by *B. Abish*, who showed evidence of a long-term "memory" (temporal dependence) of atmospheric aerosols in the region of India. On a similar regional and topical theme, *Dimitris Kaskaoutis* of Shiv Nadar University classified weather conditions which contributed to aerosol events over the Indo-Gangetic Plains. Kaskaoutis contrasted the difference between post-monsoon and winter conditions, for which the aerosols are primarily anthropogenic, and the pre-monsoon and monsoon conditions, which include a dust component. The monsoon also was a major player in the research of *Karl Szekielda*, who observed monthly changes in chlorophyll concentrations on the west coast of Luzon, Philippines. One reason for enhanced chlorophyll concentration was the flow of advected water out of Manila Bay.

A team led by NASA's *Maria Tzortziou* looked at ozone (O_3) and nitrogen dioxide (NO_2) concentrations for the Chesapeake Bay urban watershed. The team used Pandora spectrometers and data collected from aerial campaigns, and compared these data to satellite data from the Ozone Measuring Instrument (OMI) and with air-quality models. O_3 exhibited a distinct weekly cycle in this region. *Radina Soebiyanto*, Goddard Earth Sciences Technology and Research, looked at the connection between seasonal influenza (the "flu") and specific humidity in three Central American countries. *Katrin Schmidt* of the British Antarctic Survey used Giovanni and other data sets to look at factors that control phytoplankton productivity around South Georgia Island in the Southern Ocean. One of the key factors was iron in the fecal pellets of krill, which can be released by microbial digestion, and which could subsequently fertilize phytoplankton growth "downstream" in the currents around the island. *Julius Akinyoola* used Giovanni to characterize aerosol concentrations over Nigeria. He found the highest concentrations occurred in the industrialized coastal region of southern Nigeria, where petroleum production is an important activity.

***Sergei Sitnov* of the A.M. Obukhov Institute of Atmospheric Physics used Giovanni in research that detailed the effects of the blocking anticyclone that occurred over Eastern Russia in the summer of 2010. An intense heat wave, dry soils, and huge wildfires occurred during this event, which caused very high concentrations of aerosols and carbon monoxide in the atmosphere. The abnormal weather also caused a "mini-hole" of ozone depletion on the stratosphere over Russia. Aerosols over the Indo-Gangetic Basin from 2000-2012 were the subject of *Margaret Wonsick* and *Rachel Pinker's* poster. They compared satellite (MODIS and MISR) data to model data and determined the potential effects of aerosols during the period March-May, the build-up to the monsoon season.**

Background:
Spatial distribution of the mean Terra MODIS AOD550 over Indian sub-continent and adjoining oceanic regions for the six atmospheric circulation clusters. (From the poster by Dimitris Kaskaoutis)

Links to the live presentations

Day 1, November 10, 2014

Opening Remarks- *James Acker*
http://earthdata.adobeconnect.com/p8dcmo8noo3/

Current Status: Giovanni- *James Acker*
http://earthdata.adobeconnect.com/p7chhqe32kl/

Giovanni-4 Status- *Chris Lynnes*
http://earthdata.adobeconnect.com/p5i774ag2vb/

Research Highlights- *James Acker*
http://earthdata.adobeconnect.com/p2p6bxip0sw/

Decadal Trends in Global Pelagic Ocean Chlorophyll: A New Assessment Combining Multiple Satellites, In Situ Data, and Models- *Cecile Rousseaux*
http://earthdata.adobeconnect.com/p3cxbb705d2/

The use of Giovanni in examining air quality in West Africa associated with summer and winter season Saharan dust events- *Gregory Jenkins*
Part 1: http://earthdata.adobeconnect.com/p962a7t7n58/
Part 2: http://earthdata.adobeconnect.com/p99lvid9ngp/

NASA GIOVANNI TOOL – A Unique Tool to Understand Land-Ocean-Atmospheric Coupling Associated with Natural Hazards- *Ramesh Singh*
http://earthdata.adobeconnect.com/p1ri1jpp4zc/

Day 2: November 12, 2014

Meridional distribution of aerosol optical thickness and cloud fraction over the tropical Atlantic Ocean- *Pavel Kishcha*
http://earthdata.adobeconnect.com/p4wks757pmi/

Mesoscale and Nutrient Conditions Associated with the Massive 2008 *Cochlodinium polykrikoides* Bloom in the Sea of Oman/Arabian Gulf- *Adnan Al-Azri*
http://earthdata.adobeconnect.com/p55skfrmprs/

Use of Satellite Remote Sensing to Improve Coastal Hypoxia Prediction- *John Lehrter*
http://earthdata.adobeconnect.com/p3s61bwrtr1/

Advection of fluvial source into the center of Gulf of Mexico after Tropical Cyclone Isaac- *Bumjun Kil*
http://earthdata.adobeconnect.com/p20d2hcfie8/

Wind to zooplankton: Ecosystem-wide influence of seasonal wind-driven upwelling in and around the Delaware Bay -*Yoana Voynova*
http://earthdata.adobeconnect.com/p6de5vkgety/

Day 3- November 13, 2014

How a synergy of GOCART, MODIS and AERONET data can be used to trainneural networks for producing global aerosol volume size distributions from space- *Michael Taylor*
http://earthdata.adobeconnect.com/p8rvtygboy6/

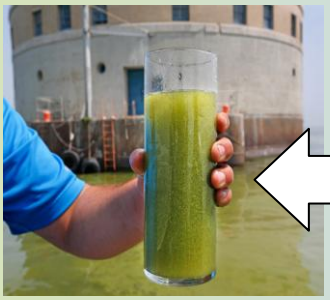
Phytoplankton dynamics and time-varying ecosystem indicators using NASA-Giovanni data- *Shovonlal Roy*
http://earthdata.adobeconnect.com/p8w4yoobbpi/

The radiative forcing of carbonaceous aerosols over California based on satellite and ground observations- *YangYang Xu*
http://earthdata.adobeconnect.com/p5pzxxqoa9j/

Characterization of Environmental Factors Before and During the Lake Erie Toxic Phytoplankton Bloom in August 2014- *James Acker*
http://earthdata.adobeconnect.com/p5koj1boj25/

The Lake Erie Toxic Phytoplankton Bloom of August 2014

(Highlights from the presentation given at the 2nd Gregory G. Leptoukh Online Giovanni Workshop)

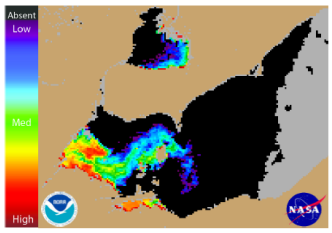


Water sample at the site of the Toledo water intake crib. High concentrations of *Microcystis* caused a "Do Not Drink" order for the city of Toledo water supply.

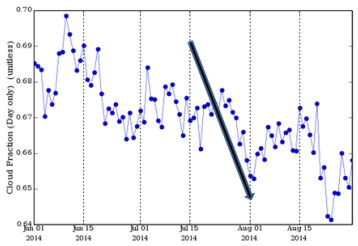
Conditions in the western end of Lake Erie at the end of July 2014 were perfect for the cyanobacteria *Microcystis*, a toxic phytoplankton species. High water temperature, low wind speeds, and an elevated nutrient load from higher-than-normal spring runoff set the stage for this disruptive event.

Giovanni time-series indicated that cloud fraction measured by MODIS-Aqua, which has an afternoon viewing time, decreased in the days prior to the event. Lots of sunlight and calm wind conditions led to an explosive and unexpected increase in *Microcystis* concentrations.

MODIS image of the bloom on August 3, 2014, showing the location of the Toledo water intake crib.



The NOAA cyanobacterial index shows the worst stage of the bloom on August 3.



Decrease in MODIS-Aqua cloud fraction several days prior to the dangerous *Microcystis* bloom.

Giovanni makes anytime
the right time
to understand your world
a little better.

http://giovanni.gsfc.nasa.gov